

Claims Listing:

1(original). A method for producing a die insert for engaging tubular members comprising the steps of:

a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;

b. coating at least a portion of said front surface with a granular particle coating and a brazing matrix; and

c. heating said die body until said brazing matrix melts, thereby adhering said granular particles to said front surface and softening said metal to a second lesser hardness, such that said front surface may engage a tubular member with sufficient force to embed said granular particles in said front surface without reducing the standard diameter of the tubular member.

2(original). A method according to claim 1, wherein said step of heating said die body includes heating said die body at a temperature between about 150 °C and about 1400 °C.

3(original). A method according to claim 1, wherein said step of heating said die body includes heating said die body at a temperature between about 600 °C and about 1400 °C.

4(original). The method according to claim 1, wherein said step of providing a die body includes providing a die body having a concave arcuate shape for gripping the outer perimeter of a tubular member.

5(original). The method according to claim 1, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.

6(original). The method according to claim 1, wherein said step of heating includes heating said granular particle coating and said a brazing matrix to a temperature sufficient to cause said brazing matrix to reach at least a semi-solid state.

7(original). The method according to claim 1, wherein said heating step includes heating said front surface sufficiently to obtain a hardness of approximately 70 HRB.

8(previously presented). The method according to claim 1, wherein said granular particle coating includes a refractory metal comprising at least one carbide of silicon, tungsten, molybdenum, chromium, tantalum, niobium, vanadium, titanium, zirconium, or boron.

9(original). A die insert for engaging tubular members produced by the process comprising the steps of:

- a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;
- b. coating at least a portion of said front surface with a granular particle coating and a brazing matrix;
- c. heating said die body until said brazing matrix melts, thereby adhering said granular particles to said front surface and softening said metal to a second lesser hardness; and
- d. thereby producing a die with a softened metal body such that said front surface may engage a tubular member with sufficient force to embed said granular particles in said front surface without reducing the standard diameter of the tubular member.

10(original). A method for producing a die insert for engaging tubular members comprising the steps of:

- a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;
- b. coating at least a portion of said front surface with a granular particle coating having a second hardness greater than said first hardness; and
- c. adhering said granular particle coating to said front surface such that said front surface may engage an oilfield tubular member with sufficient force to embed said granular particles in said front surface without reducing the standard diameter of the tubular member.

11(previously presented). The method according to claim 10, wherein said step of adhering said granular particle coating to said front surface comprises using a low temperature curing adhesive.

12(previously presented). The method according to claim 10, wherein said step of adhering said granular particle coating to said front surface comprises using a brazing matrix with a melting point less than approximately a transformation starting temperature for said metal front surface.

13(previously presented). The method according to claim 10, wherein said step of adhering said granular particle coating to said front surface comprises using a thermal spray process wherein a molten metallic brazing matrix mixed with granular particles is sprayed onto said front surface in a manner which does not raise the temperature of said front surface above a transformation temperature for said metal front surface.

14(original). The method according to claim 9, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.

15(original). The method according to claim 10, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.

16(previously presented). A method for producing a die insert for engaging tubular members comprising the steps of:

- a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;

- b. forming a granular coating on at least a portion of said front surface, said granular coating having a second hardness greater than said first hardness; and

- c. wherein a portion of said granular coating is capable of being embedded in said front surface when said front surface engages an oilfield tubular member with sufficient force.

17(previously presented). The method according to claim 16, wherein said step of forming a granular coating further comprises adhering granular particles to said front surface.

18(previously presented). The method according to claim 17, wherein said step of adhering said granular particles to said front surface further comprises adhering said granular particles with brazing matrix.

19(previously presented). The method according to claim 17, wherein said step of adhering said granular particles to said front surface further comprises using a thermal spray process wherein a molten metallic brazing matrix mixed with granular particles is sprayed onto said front surface.

20(previously presented). The method according to claim 16, wherein at least a portion of said granular coating comprises granules in a size range of about 100 microns to about 420 microns.

21(previously presented). The method according to claim 16, wherein said die body comprises a concave arcuate shape for gripping an outer surface of a tubular member.

22(previously presented). The method according to claim 16, wherein said step of applying a granular coating comprises transferring heat to said die body and thereby softening said die body.

23(previously presented). An apparatus for gripping an oilfield tubular member comprising a jaw member for receiving a die insert wherein said die insert is produced by a method comprising the steps of:

- a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into said jaw member;
- b. forming a granular coating on at least a portion of said front surface, said granular coating having a second hardness greater than said first hardness; and
- c. wherein a portion of said granular coating is capable of being embedded in said front surface when said front surface engages an oilfield tubular member with sufficient force.

24(previously presented). The apparatus according to claim 23, wherein said step of forming a granular coating further comprises adhering granular particles to said front surface.

25(previously presented). The apparatus according to claim 23, wherein said die body comprises a concave arcuate shape for gripping an outer surface of a tubular member.

26(new). The apparatus according to claim 23, wherein said step of forming a granular coating comprises transferring heat to said die body and thereby softening said die body.

27(new). The apparatus according to claim 23, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.

28(new). The apparatus according to claim 23, wherein said step of forming a granular coating on said front surface further comprises using a thermal spray process.